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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/085,550      | 02/26/2002  | Randy A. Barksdale   | IL-10810            | 9843             |

7590 12/08/2003

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EXAMINER

CLEVELAND, MICHAEL B

| ART UNIT | PAPER NUMBER |
|----------|--------------|
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1762

DATE MAILED: 12/08/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/085,550

Applicant(s)

BARKSDALE ET AL.

Examiner

Michael Cleveland

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 26 February 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. §§ 119 and 120**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.  
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 2/26/02
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 7/23/03
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

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### DETAILED ACTION

#### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-2 and 5-6 are rejected under 35 U.S.C. 102(b) as being anticipated by Davis et al. (U.S. Patent 4,415,605, hereafter '605).

'605 teaches using vacuum deposition to deposit a powdered phosphor (col. 4, lines 33-39).

Claim 2: The powder is heated (col. 4, line 37).

Claim 5: The pressure may be  $2 \times 10^{-6}$  torr (col. 5, lines 53-63).

Claim 6: The deposited phosphor is annealed (col. 6, lines 44-46).

3. Claims 1-5 are rejected under 35 U.S.C. 102(b) as being anticipated by Williams et al. (U.S. Patent 4,326,007, hereafter '007).

'007 teaches evaporating a phosphor powder (col. 5, lines 8-15) by vacuum evaporation (col. 4, lines 29-40).

Claims 2-3: The evaporation occurs via resistive heating (col. 4, lines 29-32) at, for example, 450 °C (col. 5, lines 38-39).

Claim 4: The thickness of the deposited layer may be 5000 Angstroms (claim 1).

Claim 5: Deposition occurs preferentially at  $8.5 \times 10^{-6}$  torr (col. 6, lines 17-19).

#### *Claim Rejections - 35 USC § 103*

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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5. Claims 6-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Williams '007 and Mimura et al. (U.S. Patent 4,777,099, hereafter '099) in view of each other.

Claims 6-7: '099 teaches vacuum evaporation of ZnS:Mn to form a 5000-Angstrom thick layer followed by annealing for 30 minutes at 400 °C (col. 4, lines 51-55), but it is silent as to the form of the evaporation source. Therefore, it does not explicitly teach that the phosphor is evaporated from a powder.

'007 is described above. It teaches that the process is suitable for depositing phosphor material such as activated zinc and cadmium sulfides (col. 3, lines 38-45), such as ZnS:Mn. It does not explicitly teach annealing the vacuum deposited phosphor.

The selection of something based on its known suitability for its intended use has been held to support a *prima facie* case of obviousness. *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945). See MPEP 2144.07. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have deposited phosphor of '099 from a powder, as taught by '007 because '007 teaches that evaporation from powders is recognized in the art as an operative method of vacuum depositing phosphors.

Claim 8: Because the prior art fairly suggests all of the explicitly disclosed annealing steps, such as time and temperature of treatment, the procedure must necessarily produce the claimed roughness or else must arise from essential features which are not present in the claims.

Claim 9: Both references disclose the deposition of an aluminum electrode on the phosphor layer ('007, col. 4, lines 11-17 and col. 6, lines 8-14; '099, col. 3, lines 28-30).

6. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Williams '007 and Mimura '099 in view of each other as applied to claim 9 above, and further in view of Ohta (U.S. Patent 5,093,210, hereafter '210).

'007 and '099 are discussed above. They teach the use of aluminum as a cathode ('099, col. 3, lines 20-30; '007, col. 6, lines 4-14), but do not teach a thickness of 400-1000 angstroms.

'210 teaches that aluminum cathodes of EL devices may have a thickness of 500 angstroms (col. 19, line 66-col. 20, line 6). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used an aluminum thickness of about 500 angstroms as the aluminum thickness of '007 and '099 with a reasonable

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expectation of success because '210 teaches that it is an operable thickness of aluminum cathodes.

7. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Williams '007 as applied to claim 1 above, and further in view of Moyer et al. (U.S. Patent 5,334,855, hereafter '855).

'007 is discussed above. It is open to the use of zinc sulfide or other phosphors ('007, col. 3, lines 38-45; '099), but does not teach the use of zinc cadmium sulfide (ZnCdS).

'855 teaches electroluminescent devices in which the phosphor layer may be zinc sulfide cadmium sulfide, or zinc cadmium sulfide (col. 2, lines 56-69). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used zinc cadmium sulfide as the particular phosphor of '007 and '099 with a reasonable expectation of success and with the expectation of similar results because '855 teaches that ZnCdS is an operative phosphor material for light-emitting devices.

8. Claims 12-14 and 16-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Williams '007 and Mimura '099 in view of each other as applied to claim 1 above, and further in view of Nakano et al. (U.S. Patent 5,098,813, hereafter '813).

'007 and '099 teach vacuum deposition of a powdered phosphor, followed by annealing, as discussed above. '007 teaches the use of tungsten basket as the powder receptacle (col. 5, lines 12-15). Therefore, '007 and '099 do not teach the use of a tantalum boat.

'813 teaches that tantalum boats may be used as the receptacle for resistive evaporation of phosphors (col. 12, lines 44-53). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a tantalum boat as the particular boat of '007 and '099 with a reasonable expectation of success and with the expectation of similar results because '813 teaches that tantalum is an operative material for boats for the vacuum deposition of phosphors.

Claims 14, 16-21: See discussion of claims 3-9 above

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9. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Williams '007, Mimura '009 and Nakano '813 as applied to claim 13 above, and further in view of Moyer '855 for the reasons discussed above regarding claim 11.

10. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Williams '007, Mimura '009 and Nakano '813 as applied to claim 13 above, and further in view of Ohta '210 for the reasons discussed above regarding claim 10.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Cleveland whose telephone number is (571) 272-1418. The examiner can normally be reached on Tuesday-Friday and alternate Mon, 8-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shrive Beck can be reached on (703) 308-2333. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.



Michael Cleveland  
Patent Examiner  
December 2, 2003